WHAT IS CLAIMED IS:

1. A light-emitting semiconductor device comprising:

a substrate;

plural semiconductor layers which are made of group III nitride group compound semiconductor formed on said substrate; and

a quantum well layer which satisfies the formula $Al_{1-x}In_xN$ ($0<x\leq1$).

2. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 1, further comprising a multiple quantum well structure in which said quantum well layer and a quantum barrier layer which satisfies the formula $Al_{1-z-y}Ga_yIn_zN$ ($0\leq y\leq1$, $0\leq z<1$, $0\leq z+y\leq1$) are laminated together alternately.

3. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 1, wherein a composition ratio x of indium (In) is in a range of $0.1\leq x\leq1$.

4. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 2, wherein a composition ratio x of indium (In) is in a range of $0.1 \leq x \leq 1$.

5. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 2, wherein a composition ratio y of gallium (Ga) is $y=1$, $y \approx 1$, or $0.9 < y \leq 1$.

6. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 4, wherein a composition ratio y of gallium (Ga) is $y=1$, $y \approx 1$, or $0.9 < y \leq 1$.

7. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 2, wherein said composition ratio x of indium (In), said composition ratio y of gallium (Ga), and a composition ratio z of indium (In) are $y=0$ and $0 \leq z < x \leq 1$, $y \approx 0$ and $0 \leq z < x \leq 1$, or $0 \leq y < 0.1$ and $0 \leq z < x \leq 1$.

8. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 4, wherein said composition ratio x of indium (In), said

composition ratio y of gallium (Ga), and a composition ratio z of indium (In) are $y=0$ and $0 \leq z < x \leq 1$, $y \approx 0$ and $0 \leq z < x \leq 1$, or $0 \leq y < 0.1$ and $0 \leq z < x \leq 1$.

9. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 2, wherein said composition ratio z of indium (In) is $z=0$, $z \approx 0$, or $0 \leq z < 0.1$.

10. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 4, wherein said composition ratio z of indium (In) is $z=0$, $z \approx 0$, or $0 \leq z < 0.1$.

11. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 5, wherein said composition ratio z of indium (In) is $z=0$, $z \approx 0$, or $0 \leq z < 0.1$.

12. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 6, wherein said composition ratio z of indium (In) is $z=0$, $z \approx 0$, or $0 \leq z < 0.1$.

13. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 7, wherein said composition ratio z of indium (In) is $z=0$, $z\approx 0$, or $0\leq z<0.1$.

14. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 8, wherein said composition ratio z of indium (In) is $z=0$, $z\approx 0$, or $0\leq z<0.1$.

15. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 1, wherein a thickness of said quantum well layer is in a range from 1nm to 10nm.

16. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 14, wherein a thickness of said quantum well layer is in a range from 1nm to 10nm.

17. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 2, wherein said quantum well layer comprises three to ten layers.

18. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 16, wherein said quantum well layer comprises three to ten layers.

19. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 2, wherein said quantum barrier layer is in a range from 3nm to 10nm.

20. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 18, wherein said quantum barrier layer is in a range from 3nm to 10nm.

21. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 1, wherein some parts of nitrogen (N) in said quantum well layer are substituted for group V dopants by doping group V impurities such as phosphor (P), arsenic (As), antimony (Sb), and bismuth (Bi).

22. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 2, wherein some parts of nitrogen (N) in at least one of said quantum well layer and said quantum barrier layer are substituted for group V dopants by doping group V impurities such as phosphor (P), arsenic (As), antimony (Sb), and bismuth (Bi).

23. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 14, wherein some parts of nitrogen (N) in at least one of said quantum well layer and said quantum barrier layer are substituted for group V dopants by doping group V impurities such as phosphor (P), arsenic (As), antimony (Sb), and bismuth (Bi).

24. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 1, wherein some parts of group III elements (Al, Ga, and In) in said quantum well layer are substituted for other group III dopants by doping group III impurities such as boron (B) and thallium (Tl).

25. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 2, wherein some parts of group III elements (Al, Ga, and

In) in at least one of said quantum well layer and said quantum barrier layer are substituted for other group III dopants by doping group III impurities such as boron (B) and thallium (Tl).

26. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 14, wherein some parts of group III elements (Al, Ga, and In) in at least one of said quantum well layer and said quantum barrier layer are substituted for other group III dopants by doping group III impurities such as boron (B) and thallium (Tl).

27. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 22, wherein some parts of group III elements (Al, Ga, and In) in at least one of said quantum well layer and said quantum barrier layer are substituted for other group III dopants by doping group III impurities such as boron (B) and thallium (Tl).

28. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 1, wherein said composition ratio x of indium (In) is $0.15 \leq x \leq 0.6$.

29. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 2, wherein said composition ratio x of indium (In) is $0.15 \leq x \leq 0.6$.

30. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 5, wherein said composition ratio x of indium (In) is $0.15 \leq x \leq 0.6$.

31. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 7, wherein said composition ratio x of indium (In) is $0.15 \leq x \leq 0.6$.

32. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 9, wherein said composition ratio x of indium (In) is $0.15 \leq x \leq 0.6$.

33. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 11, wherein said composition ratio x of indium (In) is $0.15 \leq x \leq 0.6$.

34. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 13, wherein said composition ratio x of indium (In) is $0.15 \leq x \leq 0.6$.

35. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 1, wherein said composition ratio x of indium (In) is $0.15 \leq x \leq 0.5$.

36. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 2, wherein said composition ratio x of indium (In) is $0.15 \leq x \leq 0.5$.

37. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 1, wherein a thickness of said quantum well layer is in a range from 2nm to 6nm.

38. A light-emitting semiconductor device using a group III nitride group compound semiconductor according to claim 2, wherein a thickness of said quantum well layer is in a range from 2nm to 6nm.